

## On Afrodonta Melv. and Pons., with Descriptions of New Species.

By

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With Plate XXIV.

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IN the year 1908 Messrs. Melvill and Ponsonby<sup>1</sup> founded the genus *Afrodonta*, of the family *Endodontidæ*, for receiving the new species *bilamellaris* *M. & P.* and *trilamellaris* *M. & P.* Subsequently Mr. Henry Suter wrote to Mr. Ponsonby pointing out the insufficiency of distinct generic characters to support such an arrangement, and suggesting the inclusion of these species in *Thaumatodon Pilsbry*, a section of the sub-genus *Endodonta Albers*, of the genus *Endodonta Albers*, to which the new forms seem intimately related.

Further correspondence between these gentlemen and myself ensued, in which the convenience of having a distinct group for the African forms was borne well in mind, and it was ultimately decided to be desirable to disrate *Afrodonta* from generic to sectional rank, parallel to *Helenoconcha Pils.*, etc., and near to *Thaumatodon*. The species, as far as is yet known, are confined to South Africa, and are probably separable from *Thaumatodon* by their generally smaller size, finer sculpture, and more transparent shell.

Lt.-Col. H. H. Godwin-Austen, who examined the ana-

<sup>1</sup> 'Ann. and Mag. Nat. Hist.,' ser. 8, vol. i (1908), p. 133.

tomical details of the type of *Afrodon*, has also been consulted, and, I understand, has nothing to urge in opposition to the new arrangement.

This alteration, together with the discovery of further allied species, makes a modification of the original definition desirable, and in framing it I have, for the sake of convenience in comparison, followed as far as possible Pilsbry's definition of the section *Thaumatodon* as a model.

I take this opportunity of giving a revised description and new figures of a species named *Trachycystis rotula* by Melvill and Ponsonby. A close study of this species shows that it belongs to this section of *Endodonta*, and was wrongly placed in *Trachycystis*.

The specific name being pre-occupied by Hombron in the sub-genus *Charopa* (Sec. *Charopa* s.s.), I propose to substitute for it *perfida*, in reference to the false appearance of external grooves given by the internal folds, imperfectly seen through the translucent shell, as hereinafter explained.

To Messrs. Ponsonby and Suter I am indebted for their advice and help in discussing the true position of *Afrodon*, and to Mr. J. Farquhar and Major M. Connolly for specimens for examination.

With reference to the peculiar distribution of the toothed *Endodontæ* Mr. Suter has made an interesting suggestion.

In September, 1908, on first seeing specimens of *Afrodon*, he wrote to me as follows: "These shells are as much entitled to distinction as those of *St. Helena*, known as *Helenoconcha*, though all seem to be derived from a common stock. It will be remembered that in the '*Journal de Conchyliologie*'<sup>1</sup> the late Mr. Ancy maintained that *Endodonta* was a subantarctic genus, whilst I held that it was chiefly Polynesian.<sup>2</sup> Ancy said that we could not account for the occurrence of *Helenoconcha* on *St. Helena* unless we admitted that they had come from the Antarctic continent. The discovery of these toothed *Endodontæ* in

<sup>1</sup> '*Journ. de Conch.*,' vol. xlix (1901), p. 17.

<sup>2</sup> *Ibid.*, p. 317.

South Africa affords the missing explanation, and I have made out the following hypothesis:

"The toothed Endodonta, such as *Thaumatodon*, etc., having their headquarters in Polynesia and New Zealand, migrated by the Eocene Antarctic land (*Archinotis*) westward, reaching South Africa, where we find them still living as *Afrodonta*, and from there they must have found their way across the Eocene Archhelenis to St. Helena, being known from there as *Helenoconcha*."

Genus *ENDODONTA* *Albers*,<sup>1</sup> 1850.

Sub-genus *Endodonta* *Albers*.

Section *Afrodonta* (*Melv. & Pons.*), 1908.

Shell very small, subdiscoidal, with spire low, convex; broadly umbilicate, or excavated; whorls numerous, tightly coiled; periphery rounded; surface very minutely striate or lirate, unicoloured, translucent. Aperture having one or more internal folds upon the outer wall, or the parietal wall, or both, and one tooth-like fold low on the columella or at the base. Except the parietal folds, which sometimes extend on the body whorl beyond the aperture, all are wholly internal, sometimes out of sight from the aperture. Type *Endodonta bilamellaris* (*M. & P.*).

Distribution.—South Africa.

*Endodonta* [*Endodonta* (*Afrodonta*)] *bilamellaris*  
(*Melv. & Pons.*). Pl. XXIV, fig. 18.

*Afrodonta bilamellaris* *Melv. & Pons.*, Ann. and Mag. Nat. Hist.,  
vol. i (1908), p. 134, pl.  
vii, fig. 6.

"A. testa . . . conico-depressa, tenni, cornea, profunde

<sup>1</sup> Albers, 'Die Hel.' p. 89.

umbilicata, microscopice longitudinaliter striatula; anfractibus 5, ventricosulis, angustis; apertura lunari, peristomate tenui, bilamellata, lamella vel plica altera marginem apud columellarem in medio valde intrantem, altera basali, conspicua, dentiformi.

"Alt. 0.84, diam. 1.48 mm.

"Hab.—Dargle, Natal; Edendale Falls, June 29th, 1907 (H. C. Burnup)."

The position of the inrunning fold first mentioned in the description would be better described as on the parietal wall than near the columellar margin. In the figure as reproduced the sculpture is represented as being much coarser than it really is.

Further specimens, collected in the Tongaat Beach Bush (Natal), since the species was described, exhibit, in some instances, such contortion of the parietal fold as to give it the appearance of being bifid. Two other specimens in my collection, one from Enon Bush, near Richmond, and one from Hilton Road (both in Natal), though rather above average size, have such weak development of the plaits as to suggest a distinct variety. Each was the only example of the genus found in its locality.

Since writing the above I have also found a single specimen of this species at Ntimbankulu, Mid-Illovo (Natal).

I also give an additional figure showing the basal view of the shell (fig. 18) for comparison with the similar view of trilamellaris in Melvill and Ponsonby's paper.

Endodonta [Endodonta (Afrodonta)] trilamellaris  
(*Melv. & Pons.*).

Afrodonta trilamellaris *Melv. & Pons.*, Ann. and Mag. Nat. Hist.,  
vol. i (1908), p. 134. pl.  
vii, figs. 7, 7A, 7B.

"A. testa . . . minuta, cornea, late umbilicata, planorbula; anfractibus  $4\frac{1}{2}$ , ventricosulis, undique microscopice longitudinaliter tenuistriatis; apertura lunari; peristomate

tenni, tribus lamellis plicive prædito, altera obscura ad basin, interdum incrassata, extensa, interdum dentiformi, altera collumellarem apud marginem medium, longe intrante, tertia interna, incrassata, contra aperturam extensa.

"Alt. 0·80, diam. 1·39 mm.

"Hab.—Dargle, Natal, January, 1907 (H. C. Burnup)."

Again, in the description of this species, reference is made to a columellar lamella or plait, which would be better described as about the middle of the parietal wall. In pointing out the chief distinction between the two species, bilamellaris and trilamellaris, the authors omit a character by which the shells may be distinguished in the field without the aid of a lens: bilamellaris is openly umbilicate (fig. 18), about proportionately with the three new species described hereunder (figs. 10, 13, 17), while trilamellaris is widely excavated, even in excess of perfida (fig. 4).

Endodonta [Endodonta (Afrodonta)] perfida *n. name*.

Pl. XXIV, figs. 1–6.

Trachycystis rotula *Melv. & Pons.*, Ann. and Mag. Nat. Hist.,  
vol. xix (1907), p. 99, pl.  
vi, figs. 12, 12A; *ibid.*, vol.  
i (1908), p. 135.

Shell minute, subdiscoidal, deeply and widely excavated, horn-colour, thin, translucent; whorls 5, narrow, convex, the last rounded at the periphery, deeply impressed at the sutures, very closely microscopically lirate except the first  $1\frac{1}{2}$ , which are smooth; aperture nearly erect, broadly crescentic, with thin peristome slightly thickened towards the columella, and furnished with the following internal, deep-set, strong lamellæ or folds: (A) One on the basal wall, whitish, set back from the peristome about one-fifth of the last whorl, and in-running for about one-fourth of the whorl: (B) one on the outer wall, also whitish, squarish and very strong, about the same length, and set back nearly as far from the

aperture as the basal fold, and running parallel to it; (c) one on the parietal wall, very wide, very strong, strengthening in its advance inwards, flat, angled above and below, scarcely paler than the rest of the shell, and set further back from the aperture than the other two.

Height about 0·85 to 0·95, width about 1·80 to 1·95 mm.

Hab.—Fern Kloof, Grahamstown (J. Farquhar).

The type, in the British Museum, not being available to me for exact measurement, the dimensions given above are to be taken as a fair average, ascertained from other adult examples collected by Mr. Farquhar at the same locality as the type.

The folds on the outer and basal walls, being solid, show no corresponding sulci on the outside, where, however, their positions may be seen through the semi-transparent shell. Each appears as two little pale bands nearly parallel, separated by a dark space and converging towards the ends, suggesting the presence of a groove on the outside of the shell. The reason for this complex appearance seems to be that the light, entering the thin, translucent shell from all sides, is strongly reflected from the polished exterior of the folds, thence showing, through the shell, as the pale bands: but, as it cannot escape through their solid centres, the dark spaces there intervene.

In well-matured specimens none of the folds can be clearly, if at all, discerned through the aperture before breaking away part of the outer wall, but, in younger shells, those on the outer and basal walls can be traced indistinctly.

The shell, with part of the outer wall broken away to show the internal folds, depicted in fig. 5, was, before being broken, carefully compared with the type by Mr. Ponsonby and found to correspond in every way.

Fig. 6 shows a shell with about half of the last whorl, and with it the lamellæ on the outer and basal walls, removed, exposing the parietal lamella in its full development.

Although this species is widely excavated and is furnished with three internal lamellæ, it cannot well be mistaken for *trilamellaris*, from which it differs in the following con-

spicuous characters: The shell (of *perfida*) is larger and relatively lower, though the spire is more elevated above the last whorl; the whorls are more numerous, and the folds are longer and further from the peristome, giving a deceptive appearance of external grooves not observable in *trilamel-laris*.

*Endodonta* [*Endodonta* (*Afrodonta*)] *farquhari* *n. sp.* Pl. XXIV, figs. 7-10.

Shell minute, subdiscoidal with convex spire slightly raised, deeply and moderately widely umbilicate, horn-colour, thin, translucent, silky; whorls 4, narrow, convex, the last rounded at the periphery, deeply impressed at the sutures, very closely microscopically striate except the first  $1\frac{1}{2}$ , which are smooth; aperture nearly erect, broadly crescentic, with thin peristome slightly thickened towards the columella, and furnished with the following internal whitish lamellæ or folds: (A) One near the base of the columella, strong, thick, tooth-like, pointed above, set slightly back from the peristome and running inwards only a short way; (B) three on the outer wall, one about the periphery and the other two at nearly equal distances between it and the columellar fold, the lowest being set back from the peristome a little further than the columellar, the second a little further than the lowest, and the uppermost a little further than the second, and each being about .4 mm. long, fairly strong, and well defined; (C) two on the parietal wall, one a little above and the other a little below the middle, both long and strong, specially the lower, and extending from the indistinct callus, just outside of the aperture, inwards till lost sight of in the interior of the shell.

Height 0.81, width 1.40 mm.

HAB.—Grahamstown; also Port Elizabeth, Kowie, and Bathurst, all in the Cape Province (J. Farquhar). Major Connolly has also sent me specimens from Happy Valley, Port Elizabeth.



This striking species, though relatively scarcely higher than bilamellaris and trilamellaris, has the spire slightly more raised, the body-whorl being somewhat shallower. In the umbilical region it is very like bilamellaris, but the number and arrangement of the in-running folds are abundantly distinct. I have much pleasure in associating with this shell the name of its discoverer, Mr. J. Farquhar, who has supplied me with so much material for this paper.

Judging by Pilsbry's figure of *Endodonta* [*Endodonta* (*Thaumatodon*)] *derbesiana* (*Crosse*<sup>1</sup>) in 'Man. Conch.,' 2nd ser., "Pulmonata," vol. ix, pl. iv, figs. 33, 34, a species inhabiting New Caledonia, this species (*farquhari*) bears a strong superficial likeness to *Crosse's*. The lamellæ are similar in form and position, but the latter species has an additional small plait between the three on the outer wall and that on the columella. The sculpture of the New Caledonian shell is very much coarser than that of *farquhari*. I have in my collection shells, received from correspondents in widely separated countries, agreeing inter se and labelled "*Thaumatodon derbesiana Crosse, New Caledonia*," but they do not agree with *Crosse's* description or with Pilsbry's figure of that species. I can therefore only infer that they have been wrongly identified, and I consider that they represent *Gude's* species, *E. (Thaumatodon) quadridens*,<sup>2</sup> with whose description and figures they agree very well. This species, compared with *E. (Afrodonta) farquhari*, is easily separated by the upright direction, parallel to the peristome, of the second process within the outer wall and by its much coarser sculpture.

The six lamellæ of *farquhari* naturally suggest a comparison with *E. (Thaumatodon) sexlamellata* (*Pfr.*),<sup>3</sup> but that species, being much larger and widely different in detail, need not be considered.

<sup>1</sup> *Helix derbesiana Crosse*, 'Journ. de Conch.,' vol. xxiii (1875), p. 143.

<sup>2</sup> *Gude*, 'Journ. Malac.,' vol. xii (1905), p. 13, pl. iv, figs. 9 A-D.

<sup>3</sup> *Helix sexlamellata Pfr.* in 'Zeitschr. f. Mal.' (1845), p. 85.



Endodonta [Endodonta (Afrodonta)] novemlamellaris *n. sp.* Pl. XXIV, figs. 11-13.

Shell minute, depressed conic-oval, with convex spire slightly raised, deeply and moderately widely umbilicate, horn-colour, thin, translucent, silky; whorls  $4\frac{1}{2}$ , narrow, convex, the last rounded at the periphery, deeply impressed at the sutures, very closely microscopically striate except the first, which is smooth; aperture nearly erect, crescentic, with thin peristome, slightly thickened towards the columella, and furnished with the following internal, short, in-running, whitish lamellæ or folds: (A) One near the base of the columella, strong, thick, tooth-like, pointed above; (B) six on the outer wall about equidistant from each other, the first, above the periphery, very small, the second and longest (about 0.15 mm. long) about the periphery, and four below gradually getting smaller and nearer the peristome; (C) two on the parietal wall, in form and position like those of *farquhari*.

Height 0.78, width 1.22 mm.

Hab.—Grahamstown (J. Farquhar); also Kowie (Farquhar), and Kingwilliamstown (Godfrey, per Connolly), all in the Cape Province.

The smallest species of the group yet examined, this has a relative height in excess of that of *farquhari*, an effect produced, not by an increased height of the spire, but by the greater depth of the last whorl. The difference is, however, not so great as would appear from the given dimensions, which are taken from the figures, not from the shells themselves. Thus, the figure of the present species (fig. 11) shows a little more of the base than that of *farquhari* (fig. 8), so, while shortening the spire in perspective, the whole height is slightly exaggerated.

It would appear from some young specimens supplied to me by Mr. Farquhar that the folds are developed at a very early age, and that the mollusc, as it advances towards maturity,

absorbs the material from the inner ends of the lamellæ, and adds it to the outer ends; for the youngest of the shells, consisting of no more than three whorls, and measuring only half a millimetre in greatest diameter, is furnished with a complete set of lamellæ; yet in the adult none of the folds, or at least none of those on the outer wall, extends inwards more than 0.4 mm. from the peristome.

The specimen from Kingwilliamstown is slightly larger than the type, and is the largest shell of the species that I have seen, measuring 0.79 mm. in height and 1.32 in width. It belongs to the collections of the South African Museum, Cape Town.

Endodonta [Endodonta (Afrodonta)] inhluzaniensis  
*n. sp.* Pl. XXIV, figs. 14-17.

Shell minute, depressed conic-oval with convex spire slightly raised, deeply and moderately widely umbilicate, pale horn-colour, thin, translucent, dull; whorls 4, narrow, convex, the last rounded at the periphery, deeply impressed at the sutures, closely microscopically lirate, except the first  $1\frac{1}{2}$ , which are smooth; aperture nearly erect, crescentic, with a distinct callus connecting the ends of the thin peristome, which is slightly thickened towards the columellar margin. The aperture contains two strong whitish in-running lamellæ or folds as follows: one on the basal wall, rather short, set back a little from the peristome; and one on the outer wall, longer and set further back.

Height 0.86, width 1.44 mm.

Hab.—Inhluzani Mountain, Natal (Burnup).

Only four specimens of this species have yet been found, and all were dead. The pale colour and dulness of the type are probably due to the influence of the weather, for one specimen, rather smaller than the type, is darker and shows the silky lustre of the other species described in this paper. The internal folds of the type can be seen through the shell (as shown in figs. 16 and 17) only by wetting it, but in the

fresher shell they can be seen as distinctly as in the types of the preceding species. Although only bilamellate, this species cannot be confused with bilamellaris (*M. & P.*), which, in addition to the basal fold, has its only other process on the parietal instead of the outer wall. The sculpture of the present species, though rather coarser than that of any other known species of the section, is very much finer than that of any species of *Thaumatodon* that I have examined.

The types of the new species will be placed in the British Museum.

#### EXPLANATION OF PLATE XXIV,

Illustrating Mr. H. C. Burnup's paper "On *Afrodonta Melv.* & *Pons.*, with Descriptions of New Species."

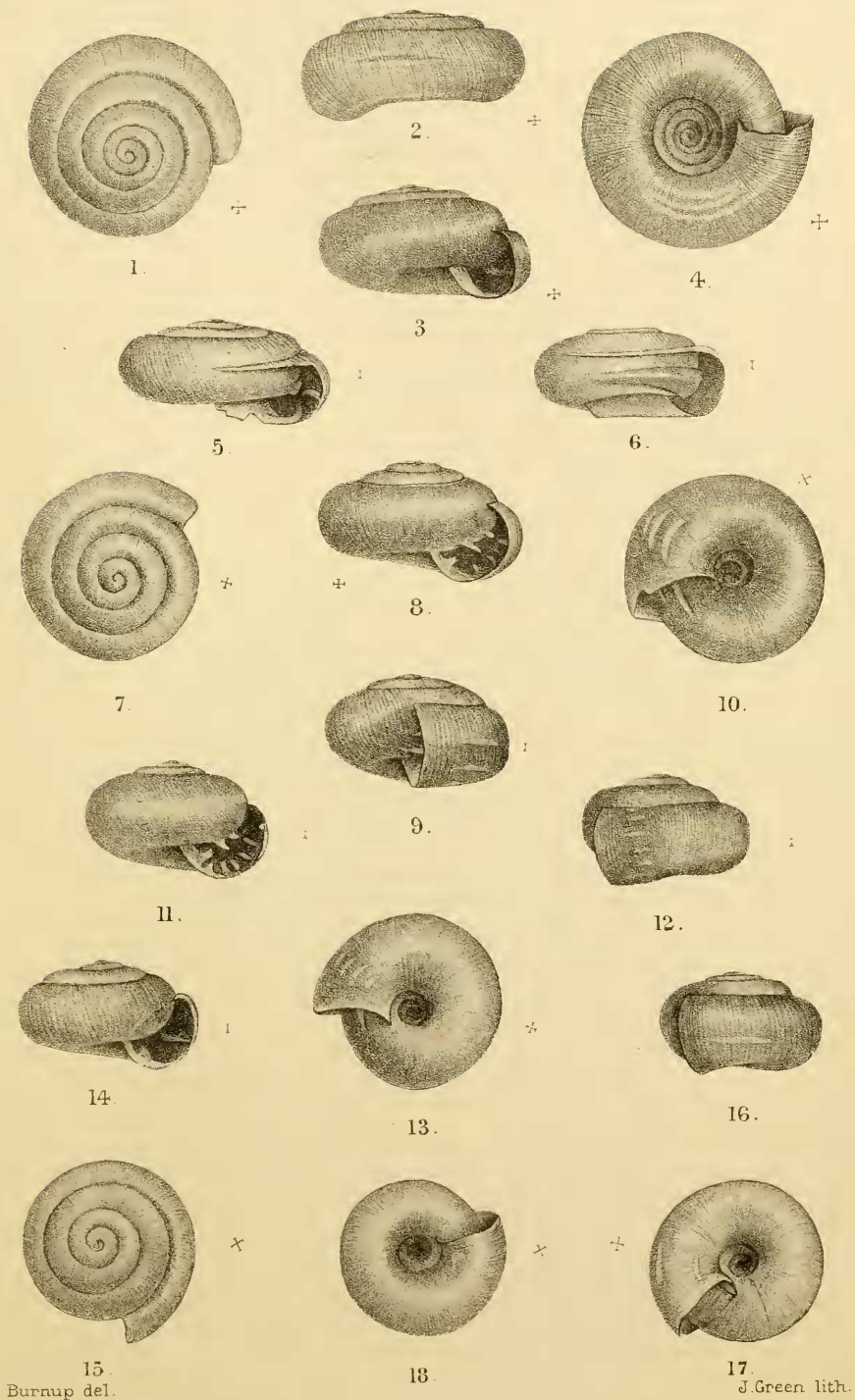
FIGS. 1-6.—*Endodonta* [*Endodonta* (*Afrodonta*)] *perfida* *n. name.*

FIGS. 7-10.—*Endodonta* [*Endodonta* (*Afrodonta*)] *farquhari n. sp.* (Fig. 8 only is drawn from the type.)

FIGS. 11-13.—*Endodonta* [*Endodonta* (*Afrodonta*)] *novem-lamellaris n. sp.* (Type.)

FIGS. 14-17.—*Endodonta* [*Endodonta* (*Afrodonta*)] *inhluza-niensis n. sp.* (Type.)

FIG. 18.—*Endodonta* [*Endodonta* (*Afrodonta*)] *bilamellaris* (*M. & P.*)



SOUTH AFRICAN ENDODONTÆ  
(Sec. AFRODONTA).